

CLAIMS

1. Method of separating semiconductor elements on a substrate, such as semiconductor elements formed in a wafer of semiconductor material, using a laser producing at least one primary laser beam, wherein said at least one primary laser beam is split into a plurality of secondary laser beams using a first diffraction grating having at least a first grating structure and by impinging said at least one primary laser beam on said first grating structure, and wherein at least one first score is formed by moving said laser relative to said substrate in a first direction, said method further comprising a step of forming at least one second score by moving said laser relative to said substrate in a second direction, characterised in that, before said step of moving said laser relative to said substrate in said second direction, said method comprises a step of altering said first grating structure to a second grating structure.
2. Method according to claim 1, wherein said step of altering said first grating structure comprises translating said first diffraction grating, such that said at least one primary laser beam impinges on said second grating structure.
3. Method according to claim 2, wherein said second grating structure is comprised by said first diffraction grating.
4. Method according to claim 2, wherein said second grating structure is formed on a second diffraction grating.
5. Method according to any of the previous claims, wherein said first and second grating structures are chosen such that said second grating structure is a mathematical image of said first grating structure by rotating said first grating structure over a rotation angle.
6. Method according to claim 5, as dependent on claim 1, wherein said step of altering said first grating structure comprises rotating said first diffraction grating for forming said second grating

structure.

7. Method according to claim 6, wherein said step of rotating said first diffraction grating comprises rotating relative to an axis of rotation transverse to said at least one primary laser beam.

8. Method according to claim 6, wherein said step of rotating said first diffraction grating comprises rotating relative to an axis of rotation parallel to said at least one primary laser beam.

9. Method according to any of the previous claims, wherein said second direction is transverse to said first direction.

10. Device for separating semiconductor elements formed on a substrate, such as semiconductor elements formed in a wafer of semiconductor material, comprising a laser arranged for producing at least one primary laser beam, a first diffraction grating having at least a first grating structure, said first diffraction grating arranged for splitting said at least one primary laser beam into a plurality secondary laser beams by impinging said at least one primary laser beam onto said first grating structure, means arranged for moving said substrate relative to said laser in at least a first direction for forming a first score, said means arranged for moving being further arranged for moving said substrate relative to said laser a second direction for forming a second score, characterised in that, said device further comprises means arranged for altering said first grating structure to a second grating structure.

11. Device according to claim 10, wherein said means arranged for altering said first grating structure are arranged for translating said diffraction grating relative to said at least one primary laser beam, such that said at least one primary laser beam impinges on said second grating structure.

12. Device according to claim 11, wherein said second grating structure is comprised by said first diffraction grating.

13. Device according to claim 11, further comprising a second

diffraction grating comprising said second grating structure.

14. Device according to any of the claims 10-13, wherein said second grating structure is a mathematical image of said first grating structure by rotating said first grating structure over an angle of rotation.

15. Device according to claim 14, wherein said means arranged for replacing said first grating structure are arranged for rotating said first diffraction grating around an axis of rotation transverse to said at least one primary laser beam.

16. Diffraction grating for use in a method according to any of the claims 1-9, said diffraction grating comprising a first part having a first grating structure and a second part having a second grating structure.

17. Diffraction grating according to claim 16, wherein said second grating structure is a mathematical image of said first grating structure by rotating said first grating structure over an angle of rotation.

18. Diffraction grating according to claim 17, wherein said rotation angle is a straight angle.